Effects of restricting pub closing times on assault rates in Newcastle Australia 5 years on

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Background

- Restricting opening hours cited as an important intervention but surprisingly little empirical evidence
  - ~ 2 short paragraphs in Babor et al 2003 *Alcohol: No Ordinary Commodity.* (slightly more in 2010 edition)
  - ~ Stockwell & Chikritzhs. *Crime Prevention and Community Safety* 2009;11(3):153-70.

- Evidence since 2002: most relates to liberalisation of hours
  - ~ e.g., Chikritzhs et al (2002, 2006, 2007): 12am to 1am in Perth
  - ~ Important Norwegian study 2012 (Rossow & Norstrom, Addiction, 2012, 107: 530-7)

- The rest concerns unusual conditions: border crossings, remote indigenous communities
  - ~ US border w/ Mexico (Voas et al); w/ Canada (Vingilis et al)
  - ~ Halls Creek, Australia (Douglas 1998)

The Newcastle experiment

- Police and community complain to state govt about high levels of crime from pubs in the Central Business District

- Liquor Administration Board forces 14 pubs to close earlier: 3am (with 1am "lockout" / "one-way door") – previously 5am

- Took effect 21 March 2008 (weakened to 3.30am/1.30am on 29 July 2008)

Aims

- Test the hypothesis that this intervention reduced the incidence of assault in the Newcastle CBD.

- Investigate geographic displacement (from the CBD to the nearby control area) and temporal displacement (to earlier in the evening).

- Determine whether effects seen in the 1.5 years post change persisted in the following 3.5 years (to March 2013)

Methods

Design:

Controlled Before and After Design in which the Central Business District (CBD) was the intervention area and a nearby area with similar characteristics served as the control.

Update: Pre-post design in two locations with comparison of two post-change periods

The ideal control site

- Affected identically by determinants of drinking and other assault risk factors
  - ~ macro-economic conditions
  - ~ transport variables

- Consisting of the same demographic mix of patrons

- Same types of outlets

- Not too close to the intervention site
  - ~ If close, smaller in size (to detect displacement)

Methods cont'd

Case definition

- Incidents in which police were called to, or themselves observed, a criminal act involving common assault, actual or grievous bodily harm, assault of police, or shooting with intent other than to murder, as defined under the NSW Crimes Act 1900, and irrespective of whether there was a subsequent charge or conviction. (Excludes domestic violence)

  ~ Occurred 10pm-6am
  ~ In postcode areas 2300 and 2302 (CBD) or 2303 (Hamilton)
  ~ Pre: April 2001 to March 2008 (28 quarters)
  ~ Post 1: April 2008 to September 2009 (6 quarters)
  ~ Post 2: October 2009 to March 2013 (14 quarters)
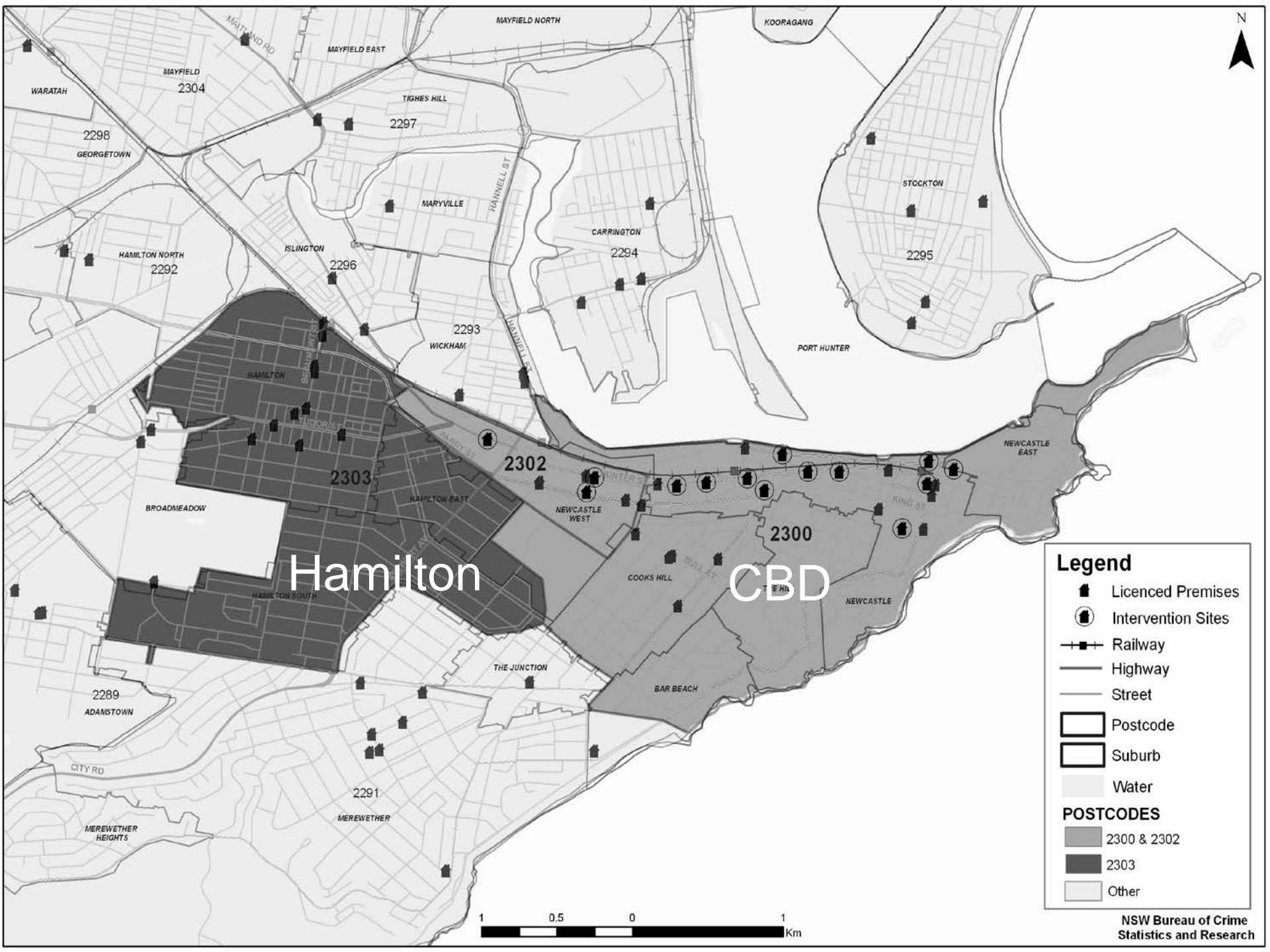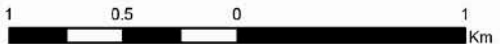
Pop. 530,000
6th largest city in Australia

Legend

- 🏠 Licenced Premises
- 🅗 Intervention Sites
- ┼■┼ Railway
- ─── Highway
- ─── Street
- ▭ Postcode
- ▭ Suburb
- ▭ Water

POSTCODES
- 2300 & 2302
- 2303
- Other

NSW Bureau of Crime
Statistics and Research

Gender and age distributions of people involved in assaults in the study areas

		CBD		Hamilton	
		Males	Females	Males	Females
Person of interest					
	Pre	2428 (82%)	521 (18%)	562 (83%)	119 (17%)
	Post	209 (82%)	46 (18%)	79 (63%)	46 (37%)
Mean Age (SD)		23.8 (7.3)	20.0 (6.6)	28.7 (9.3)	27.2 (8.0)
Victim					
	Pre	4170 (81%)	980 (19%)	969 (83%)	192 (17%)
	Post	377 (76%)	118 (24%)	1144 (97%)	41 (3%)
Mean Age (SD)		25.7 (8.2)	23.4 (7.2)	30.3 (9.7)	29.0 (9.7)
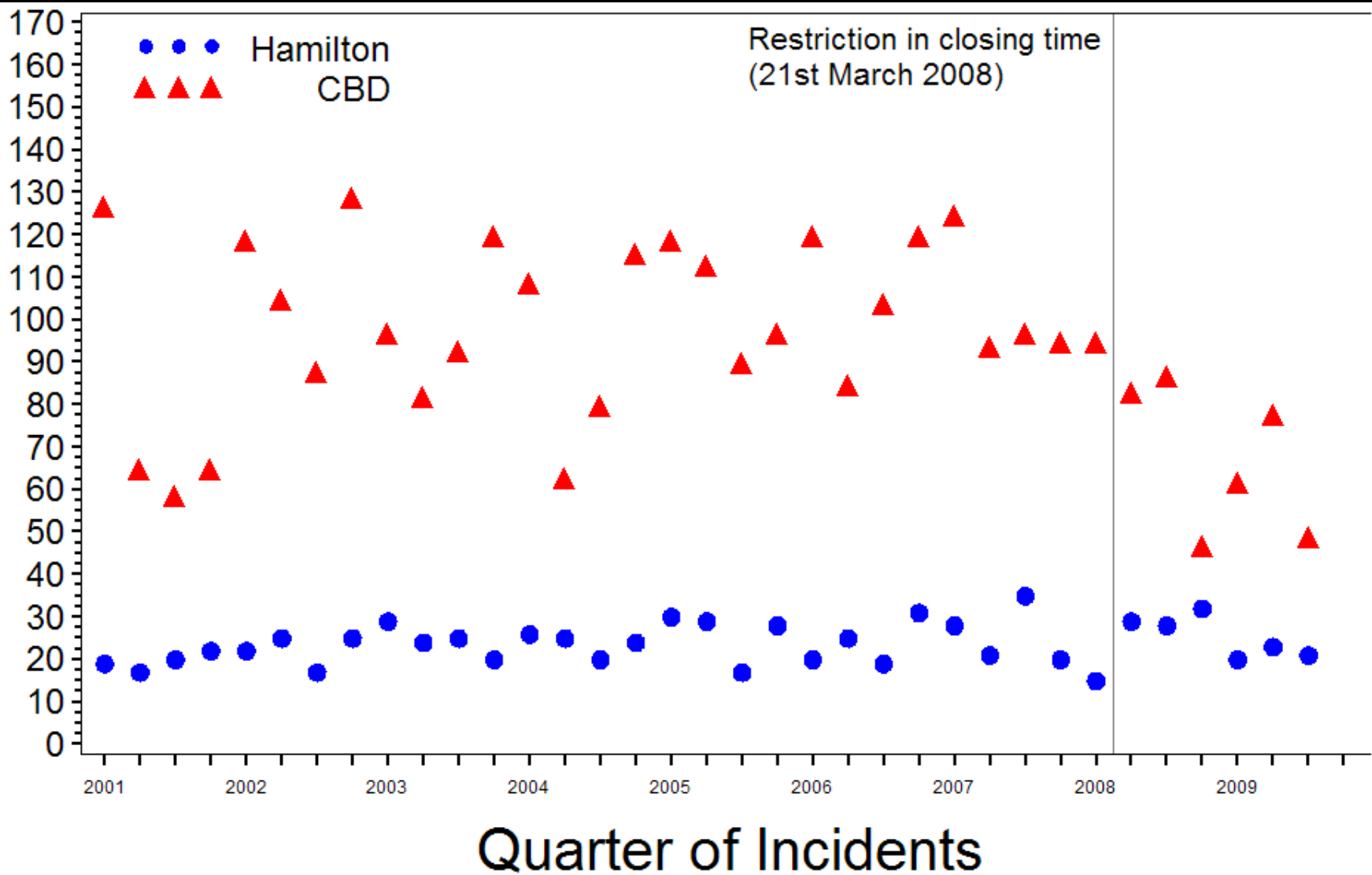
Assaults per quarter before and after the change in closing time

	Pre N	Post N	Post/Pre incidence rate ratio (95% CI)	Relative Post/Pre incidence rate ratio (95% CI)	P
CBD (Intervention area)	99.0	67.7	0.68 (0.58 to 0.80)	**0.63 (0.48, 0.82)**	0.0005 [a]
Hamilton (Control area)	23.4	25.5	1.09 (0.88 to 1.35)	1.00 Reference	-

[a] For area by time interaction term in negative binomial regression model
Note: only cases "accepted" by a supervising officer included

CBD

	Before 3am		After 3am		Chi-squared test	
	N	%	N	%	Statistic	P-Value
Pre	2000	73	738	27	41.4881	<.0001
Post	369	88	52	12	.	.

Hamilton

	Before 3am		After 3am		Chi-squared test	
	N	%	N	%	Statistic	P-Value
Pre	522	79	138	21	0.1556	0.6933
Post	124	81	30	20	.	.

Selection bias?

- As a consequence of being under regulatory scrutiny, did licensees in the CBD under-report assaults to police after the intervention was in place to a greater extent than beforehand.
    - ~ They threatened to do so

Number and proportion of assaults recorded in CBD and Hamilton, by person reporting the assault and year (Q4 of 2007 or Q4 of 2008)

	Reported/detected by…				
Location / time period	*Pub staff*	*Police*	*Victim*	*Other*	*Unclear*
	N (%)	*N (%)*	*N (%)*	*N (%)*	*N (%)*
CBD					
Quarter 4 2007	13(9.9)	16 (12.2)	51 (38.9)	40 (30.5)	11 (8.4)
Quarter 4 2008	7 (7.7)	6 (6.6)	35 (38.5)	35 (38.5)	8 (8.8)
$\chi^2_4=3.0$, $p=0.554$					
Hamilton					
Quarter 4 2007	4 (8.2)	1 (2.0)	19 (38.8)	20 (40.8)	5 (10.2)
Quarter 4 2008	1 (1.7)	6 (10.3)	24 (41.4)	20 (34.5)	7 (12.1)
$\chi^2_4=5.6$ [a], $p=0.234$					

Addiction
Volume 106, Issue 2, Article first published online: 15 SEP 2010
Abstract | Full Article (HTML) | References | Cited By

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Effects of restricting pub closing times on night-time assaults in an Australian city

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ABSTRACT

Aims In March 2008 the New South Wales judiciary restricted pub closing times to 3 a.m., and later 3.30 a.m., in the central business district (CBD) of Newcastle, Australia. We sought to determine whether the restriction reduced the incidence of assault. **Design** Non-equivalent control group design with before and after observations. **Setting** Newcastle, a city of 530 000 people. **Participants** People apprehended for assault in the CBD and nearby Hamilton, an area with a similar night-time economy but where no restriction was imposed. **Measurements** Police-recorded assaults in the CBD before and after the restriction were compared with those in Hamilton. Cases were assaults occurring from 10 p.m.–6 a.m. from January 2001–March 2008, with April 2008–September 2009 as the post-restriction period. We also examined changes in assault incidence by time of night. Negative binomial regression with time, area, time × area interaction terms and terms for secular trend and seasonal effects was used to analyse the data. Autocorrelation was examined using generalized estimating equations. **Findings** In the CBD, recorded assaults fell from 99.0 per quarter before the restriction to 67.7 per quarter afterward [incidence rate ratio (IRR): 0.66, 95% confidence interval (CI): 0.55–0.80]. In the same periods in Hamilton, assault rates were 23.4 and 25.5 per quarter, respectively (IRR: 1.02, 95% CI: 0.79–1.31). The relative reduction attributable to the intervention was 37% (IRR = 0.63, 95% CI: 0.47–0.81) and approximately 33 assault incidents were prevented per quarter. **Conclusion** This study indicates that a restriction in pub closing times to 3/3.30 a.m. in Newcastle, NSW, produced a large relative reduction in assault incidence of 37% in comparison to a control locality.

Keywords Alcohol, assault, closing, hotels, licensed premises, opening hours, pubs, trading hours.

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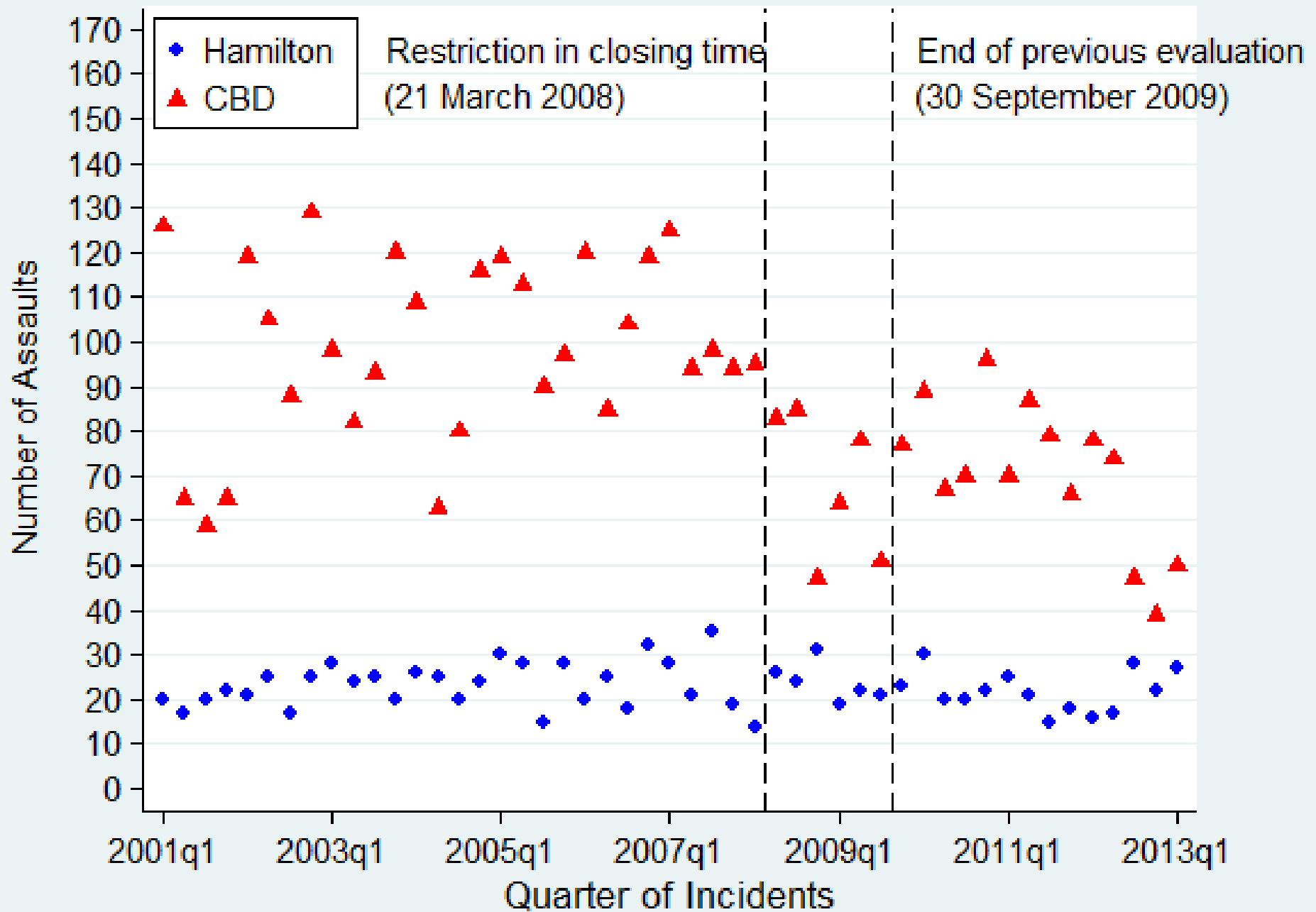
Assaults per quarter before and up to 5 years after the restriction in closing time

	Mean number of assaults per quarter			Post/Pre Incidence rate ratio (95% CI)	
	Pre Apr 2001 to Mar 2008	Post 1 Apr 2008 to Sep 2009	Post 2 Oct 2009 to Mar 2013	Post 1/Pre (Replication of previous study)	Post 2/Pre (New finding)
CBD (Intervention area)	99	68	71	**0.67** (0.55 to 0.82)	**0.68** (0.55 to 0.85)
Hamilton (Control area)	23	24	22	0.97 (0.73 to 1.28)	0.86 (0.61 to 1.20)

Discussion

- Assaults -33% in CBD (consistent with Norwegian finding of 20% / hour)
  - ~ Effects have persisted

- No evidence of geographic or temporal displacement (i.e. the problem does not "just move somewhere else")

- No evidence of selection bias due to reduced and differential reporting by licensees

- Effect of weekend Lockouts in Hamilton from August 2010
  - ~ Unclear: decreases in 2011/12 and increases in 2012/13

- Threats to validity of effect estimates:
  - ~ Lag longer than expected – plausible ?
  - ~ Policing levels greater in intervention area? (toward null)

- Mechanisms of intervention:
  - ~ Reduced exposure:
    - fewer patrons ?
    - less foot traffic ?
  - ~ Reduced consumption
    - Improved service practices (effect of scrutiny) ?
    - Fewer hours of service

Co-investigators

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Analysis

- Negative binomial regression to model the number of assaults per month in the before and after periods.

- Model included a variable to indicate the periods before and after the intervention and a variable to indicate the area in which the assault occurred.

- The difference in the change in the number of assaults across the intervention period between the two areas was tested using an interaction term between the before and after variable and the area variable.

- The exponent of the coefficient of the interaction term from this model, that is the incidence rate ratio (IRR), is an estimate of the relative difference in the percentage change in the number of assaults in the CBD compared with Hamilton.

Distribution of Assault Time